Saskatchewan Agriculture, Food and Rural Revitalization

Varieties of grain crops 2003

Crop Production Areas

The cropland of Saskatchewan has been divided into four areas based roughly on climate, vegetation and soil type. The relative yields of crop varieties tend to vary from area to area. In choosing a variety, farmers will want to consider the yields in their area and special requirements such as early maturity, disease resistance or sawfly resistance.

Area 1: Drought is a definite hazard and high winds are common. Sawfly outbreaks often occur in this area. Cereal rust may be a problem in the southeastern section.

Area 2: Drought and sawflies may be problems in the western and central sections of the area. Cereal rust may be a problem in the southeastern section.

Area 3: Drought is not as likely to be a problem in this area, particularly in the east. Cereal rust may occur in the eastern portion. The frost-free period can be fairly short in the northwestern and northeastern sections.

Area 4: Rainfall is usually adequate for crop production. However, early fall frosts and wet harvest weather are frequent problems.

Note About Dividing Lines:

The dividing lines do not represent distinct changes over a short distance. The change from one area to another is gradual.

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Symbols Used in 2003 Seed Guide:

^ Variety may not be described in 2004

— Insufficient test data to describe

Plant Breeders' Rights at time of printing

Applied for PBR protection at time of printing

Abbreviations used:

Relative maturity: VE = Very Early, E = Early, M = Medium, L = Late, VL = Very Late

Resistance: VG = Very Good, G = Good, F = Fair, P = Poor, VP = Very Poor

n/a = not applicable

Seed size: S = Small, M = Medium, L = Large

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Testing varieties in Saskatchewan

By Saskatchewan Agriculture, Food and Rural Revitalization

The performance of crop varieties is tested regularly at a number of locations across Saskatchewan. Data from these trials are summarized and interpreted by the Saskatchewan Advisory Council on Grain Crops every year.

The trials are conducted by researchers from plant breeding institutions. The most recently registered varieties and promising experimental lines that might become registered are compared to standard varieties.

Wheat, oat, barley and flax varieties are grown at all locations, while canola, mustard, field pea, lentil, bean and chickpea are tested in those regions where they are best adapted. Information on sunflower production is received from trials conducted under the auspices of the Saskatchewan Sunflower Committee.

The reaction of varieties to diseases and seed treatment recommendations are updated and forwarded to the Grain Crops Council by pathologists who meet as members of the Plant Disease Subcouncil of the Council on Crop Protection.

Variety trials are grown both on farmers' fields and research stations. Multiple small plots of the various varieties are sown and harvested with small-scale press-drills and combines.

Relative yield of varieties

Grain yield results from the interplay of genetic factors and non-genetic factors. Variety trials are designed to measure the differences among varieties that are due to genetic causes. It is important to minimize variability due to non-genetic factors such as soil type, nutrients, moisture, weeds, diseases, and other pests.

Experimental designs using replication (repeated plantings of the varieties) and randomization (the position of the varieties within the test are assigned by chance) are then used to estimate the precision with which the genetic factors can be measured. Yield potential of a variety is estimated by measuring the weight of grain produced per unit area.

Comparisons among varieties for yield potential involves an evaluation of both their absolute amounts of grain and their relative yield. Relative yield is the yield of one variety expressed as a percentage of a second variety.

Yields obtained in these trials are not identical to those obtained under commercial production conditions. However, the average yield for these varieties, obtained over a number of years at several locations, would remain in relatively the same ratio regardless of whether the grain yields were measured in small plots or large-scale fields.

Relative yields are the best estimates of expected yield advantage in the areas indicated. They are more reliable than estimates based on data from a single test or from a single location. Farmers should be aware, however, that actual yields within an area, or in a particular year, may vary substantially from the average figures reported because of natural variability.

Relative Maturity

Ratings

Relative maturity ratings are average number of days from seeding to swathing ripeness. The actual number of days to reach maturity depends on local climate and to some extent on management practices.

Some of the following tables express the relative maturity in days while others use a five category scale: VE, E, M, L, and VL (very early, early, medium, late, very late). Medium applies to the most widely grown check variety which appears at the top of each table. The limits for each category vary from crop to crop. In barley, for example, Harrington would be medium with L and E varieties plus or minus 1-2 days, and VL and VE varieties beyond these.

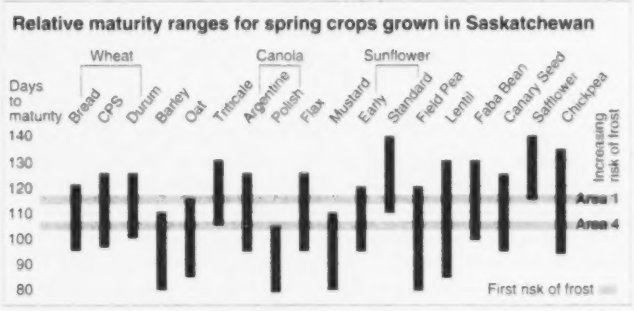
Comparisons

The relative maturity of varieties of different crops is important when making plans for seeding.

The table below compares the relative maturity ranges for crops grown in Saskatchewan.

Maturity is measured from seeding to swathing ripeness. Within each crop there are early and late maturing varieties. Whether a crop matures before the first killing frost depends on seeding date, management practices and environment factors. Not all crops have a wide area of adaptation.

Relative maturity ranges for spring crops grown in Saskatchewan



Plant Disease Resistance

Resistance to the most important diseases in western Canada is generally assessed in each crop before the variety is registered. The methods used to assess resistance in each crop are different. In some cases, spores of the pathogen are applied to plants in the greenhouse or in the field. In other cases, assessment is based on naturally occurring infection in the field. Each variety is rated on a five-point scale of very poor (VP), poor (P), fair (F), good (G), very good (VG). New varieties are not tested side-by-side with all existing varieties. Because of variation in disease levels from year to year, each new variety is assigned a rating relative to a few existing varieties that serve as disease level standards or checks.

Varieties differ in resistance because of differences in their genetic make-up and/or differences in the genetic make-up of the pathogen that causes the disease. However, the genetic make-up of a pathogen can change over time, and overcome the resistance in a variety. In such cases, a variety with good resistance can quickly display poor resistance to a particular disease. Unfortunately, because not all varieties are tested side-by-side every year, the ratings of older varieties may be less reliable.

A number of factors can affect the level of disease symptoms observed at a given location in a given year. Environmental conditions such as moisture and temperature, the genetic make-up of both the variety and the pathogen, and the amount of the pathogen present can all affect the level of disease. Although a variety with good resistance can show disease symptoms under favourable conditions, a susceptible variety would have much more disease under the same conditions.

For example, ascochyta blight of chickpea is a very aggressive fungal disease. It can completely kill susceptible varieties within two weeks of symptoms first appearing.

Current commercial chickpea varieties such as Sanford and Dwelley have some resistance to the disease. This resistance weakens as plant development nears the flowering stage. Cool, moist environmental conditions favour the disease, and if these conditions persist early in the growing season, the disease symptoms can occur much earlier than the flowering stage. This is especially true on chickpea grown outside the Brown Soil Zone (the area of best adaptation) or on heavy textured soils such as clays and clay loams.

In these conditions, varieties such as Sanford and Dwelley do not show good resistance to ascochyta and can be defoliated, with girdled branches and dead plants. If conditions turn warm and dry, the diseased plants can re-grow from auxiliary nodes, often producing flowers and pods. However, these late pods and seeds will most likely be frozen in the first fall frost and have no commercial value.

What is Plant Breeders' Rights

Plants Breeders' Rights provides a way to assure that companies and institutions that invest in plant breeding are able to keep reasonable control of their varieties and secure fair compensation for their efforts. This encourages additional investment in improved crop varieties for Canadian farmers.

PBR
Progress through Research

Plants Breeders' Rights for crop variety developers are comparable in many ways to patent protection in other areas. When a plant breeder develops a new variety for use in Canada, he may apply under the Plant Breeders Rights Act to obtain certain controls over the multiplication and sale of the seed of that variety. Sale, trade or any other transfer of the seed for propagation purposes is prohibited by law without;
1) the written permission of the breeder or his agent and;
2) payment of a royalty to the breeder or his agent. Under PBR, farmers are allowed to save seed of the variety for their own use, on their own farms.

Varieties protected by Plant Breeders' Rights are identified with the PBR logo above.

Further information on Plant Breeders' Rights can be obtained from the Plant Breeders' Rights Office, tel. (613) 225-2342, fax (613)228-6629.

Cereal Crops

Wheat

Main characteristics of varieties

Variety	Years tested	Area 1	Area 2	Area 3	Area 4	Irrigation	Relative Maturity in days	Protein	Resistance to: Lodging	Shattering	Sprouting	Stem Rust	Leaf Rust	Loose Smut	Bunt	Leaf Spot	Fusarium Head Blight
Bread Wheat		**Yield as % of AC Barrie**															
AC Barrie	10	100	100	100	100	100	100	14.7	G	G	G	G	P	G	G	P	F
AC Abbey	7	99	94	95	95	98	-1	-0.8	F	G	P	G	P	F	G	P	P
CDC Bounty	5	105	103	105	107	—	-1	-0.1	F	G	F	G	F	G	F	P	F
AC Cadillac	7	100	103	102	101	98	-1	-0.2	F	G	F	G	G	VG	VG	P	F
AC Cora	8	99	97	94	95	92	-2	-0.3	F	G	F	G	VG	G	G	P	F
Columbus^	5	—	94	93	—	84	+3	-0.2	F	F	VG	F	P	F	VG	P	P
AC Domain^	6	96	94	94	86	89	-2	+0.1	G	G	VG	G	G	VG	F	VP	P
AC Eatonia	7	92	94	90	84	—	0	+0.2	P	G	VG	F	P	F	G	P	—
AC Elsa	7	102	104	105	98	97	-1	-0.1	F	G	F	G	G	G	G	F	P
Harvest	3	103	98	105	97	—	-1	-0.4	VG	G	VG	G	G	G	G	P	VP
AC Intrepid	5	101	100	105	102	102	-3	-0.3	G	G	P	G	G	F	G	P	P
Journey	3	103	96	100	92	—	+2	+0.3	VG	G	F	G	G	F	G	F	F
Katepwa^	9	97	94	92	93	89	-2	-0.5	F	G	F	G	VP	G	G	P	F
Laura^	8	100	103	98	95	82	+1	-0.4	F	G	F	G	G	F	P	P	P
Lovitt	2	108	98	100	101		-1	+0.1	G	G	VG	G	G	G	F	—	P
AC Majestic	8	93	97	97	96	86	+2	-0.2	G	F	VG	G	P	F	G	F	F
McKenzie	5	107	105	102	96	109	-1	-0.5	F	G	G	G	VG	VP	VG	P	F
Prodigy	5	103	104	106	99	—	+1	+0.4	G	F	G	G	G	F	VG	P	VP
AC Splendor	8	91	92	95	92	89	-4	+0.4	F	G	F	G	G	F	G	VP	P
Superb	3	111	107	112	107	—	+4	-0.2	G	G	G	G	F	F	G	VP	F
CDC Teal	7	98	100	103	96	96	-2	-0.1	G	G	P	G	G	G	F	P	VP
5500HR	4	98	98	99	99	—	+1	-0.4	F	G	F	F	G	P	G	P	F
5600HR	5	99	100	99	102	—	+2	-0.5	G	G	F	F	G	G	G	P	P
5601HR	3	94	94	95	107	—	+2	-0.1	G	G	F	G	G	P	G	P	F
Alsen	0	—	—	—	—	—	+4	—	G	G	—	G	G	P	G	P	F+
Canada Prairie Spring - Red Seeded*																	
AC Crystal	10	118	120	116	118	111	+3		VG	G	P	G	P	P	VG	F	VP
AC Foremost	5	119	122	118	116	109	+2		VG	G	F	G	P	P	VG	P	VP
AC Taber	5	117	122	118	114	116	+4		VG	G	P	G	F	P	VG	F	VP
5700PR	4	115	117	121	123	117	+2		VG	G	P	G	F	P	VG	P	VP
5701PR	3	107	112	110	—	—	+2		G	G	P	G	VG	P	F	F	P
Canada Prairie Spring - White Seeded*																	
AC Karma^	8	117	122	119	121	110	+2		G	G	P	G	p	P	VG	P	P
AC Vista	8	119	124	123	121	114	+1		G	G	F	G	P	P	VG	P	VP
AC2000	4	109	111	110	109	104	+3		VG	G	F	F	P	F	VG	P	P
Hard White Wheat																	
Kanata	3	94	89	92	93	—	-2	+0.1	G	G	G	F	G	F	P	P	F
Snowbird	3	103	97	103	99	—	+2	-0.5	G	G	G	G	VG	G	F	P	F
Canada Western Extra Strong*																	
Amazon	5	102	102	105	105	—	+2	-1.1	F	G	P	G	G	VG	F	F	P
AC Corinne	5	99	101	102	106	—	+3	-1.1	F	G	P	G	G	VG	F	P	P
AC Glenavon	4	101	103	104	110	—	+2	-1.3	F	G	P	G	G	VG	F	P	P
Glenlea	8	102	105	108	112	—	+2	-1.4	F	G	P	G	F	VG	F	P	P
CDC Rama	3	108	103	108	110	—	+2	-0.2	F	G	P	G	G	VG	G	P	F
Durum Wheat		**Yield as % of Kyle**															
Kyle	13	100	100	100	100	100	+3	13.8	P	VG	F	VG	VG	P	VG	P	VP
AC Avonlea	9	105	106	109	—	106	+2	+0.1	F	VG	F	VG	VG	P	VG	P	VP
AC Melita^	6	95	96	101	—	110	+1	-0.2	F	VG	F	VG	VG	P	VG	VP	VP
AC Morse	8	104	103	109	—	111	+3	-0.1	G	VG	F	VG	VG	VP	VG	VP	VP
AC Napoleon	4	104	105	109	—	—	+2	-0.4	F	VG	F	VG	VG	P	VG	P	VP
AC Navigator	5	104	101	97	—	—	+3	-0.3	G	VG	F	VG	VG	VP	VG	VP	VP
Sceptre^	11	96	97	99	103	118	0	-0.6	G	VG	P	VG	VG	P	VG	P	VP

* Includes direct and indirect comparisons with AC Barrie

Wheat (Continued from page 4)

Additional Information

All varieties of common wheat are compared to **AC Barrie**.

Several new races of leaf rust capable of overcoming leaf rust resistance gene Lr 16 have multiplied rapidly. If varieties rated poor or very poor for leaf rust are sown in southeastern Saskatchewan, early seeding may minimize risk of crop losses.

Durum wheat varieties are more susceptible than CWRS varieties to Fusarium Head Blight and CPS varieties are intermediate.

All varieties have moderately good resistance to common root rot.

Seed of varieties rated poor and very poor for bunt and loose smut should be treated. Please refer to the **Seed Facts** section of this pamphlet or ***Guide to Crop Protection, 2003***.

Most of the varieties have been rated for their relative resistance to pre-harvest sprouting. During wet harvest weather grades drop more rapidly due to sprouting in swathed than in standing crops.

Canada Western Red Spring Wheat

Alsen has improved resistance to Fusarium Head Blight and an interim registration which may expire in 2003.

Seed of the new varieties **Harvest, Journey, Lovitt,** and **5601HR** will not be available in 2003.

Limited quantities of seed of the new varieties **5600HR** and **Superb** will be available in 2003.

AC Abbey is resistant to the wheat stem sawfly, has semidwarf stature and an awned head. **AC Eatonia** is resistant to wheat stem sawfly.

AC Cadillac and **CDC Bounty** have large seed size and an exceptionally heavy test weight.

McKenzie has an awned head and may also be identified by a purplish stem. **Prodigy** has an awned head and exceptionally heavy test weight. **Superb** has an awned head, and very large seeds. **Superb** has shorter stature than **AC Barrie** and **Katepwa**.

Canada Prairie Spring Wheat

AC Vista and **AC2000** have higher protein content, and stronger gluten than **AC Karma**. Limited quantities of seed of **5701PR** will be available in 2003.

AC Crystal, **5700PR** and **5701PR** have improved quality compared to **AC Foremost** and **AC Taber**.

Canada Western Extra Strong

Seed of **CDC Rama** will not be available in 2003. Limited quantities of seed of **Amazon, AC Corinne,** and **AC Glenavon** will be available in 2003.

Canada Western Amber Durum

All durum varieties are susceptible to two new races of loose smut. Seed can be treated to provide control. See the **Seed Facts** section for details.

Kyle receives better grades than other varieties even under adverse harvesting conditions.

AC Avonlea has shorter stronger straw than **Kyle. AC Avonlea** has higher pigment content in the grain than other varieties.

AC Morse has short strong straw like **Sceptre**, and has lower test weight than **Kyle**.

AC Napoleon has shorter and stronger straw than **Kyle** and low test weight.

AC Navigator has extra strong gluten properties and semidwarf stature. It may be grown only under contract with the Canadian Wheat Board and Saskatchewan Wheat Pool.

Soft White Spring Wheat

AC Reed and **AC Phil** are moderately resistance to shattering, powdery mildew, and common root rot, moderately susceptible to leaf and stem rust, and susceptible to common bunt. **AC Phil**, generally, has less black point than **AC Reed**. **AC Nanda** has improved resistance to common bunt, powdery mildew, and black point. It yields about the same as **Fielder** and is 2 days later maturing. Limited seed of **AC Nanda** will be available in 2003. Soft-white spring wheats are susceptible to pre-harvest sprouting.

Winter Wheat

Main characteristics of varieties

Variety	Years tested	Grain Yield as a % CDC Kestrel — Areas 1 and 2	Areas 3 and 4	Irrigation	Resistance to — Lodging	Winter Damage	Stem Rust	Leaf Rust	Bunt
CDC Kestrel	12	100	100	100	G	G	P	P	P
AC Bellatrix	4	101	97	—	G	G	VP	P	G
CDC Clair	12	100	102	97	G	G	P	P	P
CDC Osprey	12	100	100	91	G	G	P	P	P
CDC Harrier	9	103	98	106	G	G	G	P	P
CDC Falcon	8	99	93	114	VG	G	VG	G	P
CDC Raptor	7	100	100	108	VG	G	VG	G	P
CDC Buteo	5	96	97	109	G	G	G	G	P
McClintock	5	98	99	109	G	F	VG	VG	P

Rye

Main characteristics of varieties

Variety	Years tested	Yield as a % of Prima — Area 1	Area 2	Area 3	Area 4	Maturity	Resistance to — Winter Killing	Shattering	Lodging	Stem Smut
Prima	13	100	100	100	100	M	VG	F	F	G
AC Rifle	13	112	94	93	—	M	VG	VG	VG	G
AC Remington	3	128	100	99	—	M	VG	VG	G	—

Additional information:

Gazelle is the only registered variety of spring rye. **Danko** and **Kodiak** are very susceptible to winter killing in Saskatchewan and therefore should only be considered for production using some form of tillage conservation.

Triticale

Main characteristics of varieties

Variety	Years Tested	Yield as a % of AC Certa — Area 1	Area 2	Area 3	Area 4	Irrigation[x]	Test Wt kghl^{-1}	Maturity	Resistance to — Lodging	Stem rust	Leaf rust	Bunt	Root rot
AC Certa	11	100	100	100	—	100	74	M	G	VG	VG	VG	G
AC Alta	11	105	104	98	—	109	68	L	G	VG	VG	VG	F
AC Copia	11	99	99	95	—	99	72	M	G	VG	VG	VG	F
Pronghorn	11	98	102	102	—	107	69	E	G	VG	VG	VG	F
Sandro	8	106	103	100	—	—	73	E	G	VG	VG	VG	G
AC Ultima	7	106	104	102	—	—	70	E	G	VG	VG	VG	F

x Relative Yields under irrigation are based on limited data

Additional Information

Triticale matures one to two days later than **AC Crystal** CPS wheat, therefore it should be planted as early as possible. Some cultivars of triticale will mature very late in Area 4. The seeding rate for triticale should be at least 30 per cent more than that of CWRS wheat to obtain the same number of plants per square foot. Susceptiblity to Fusarium Head Blight is at least as great in triticale as in wheat. **AC Ultima** is a new cultivar of spring triticale. It has improved Hagberg Falling Number.

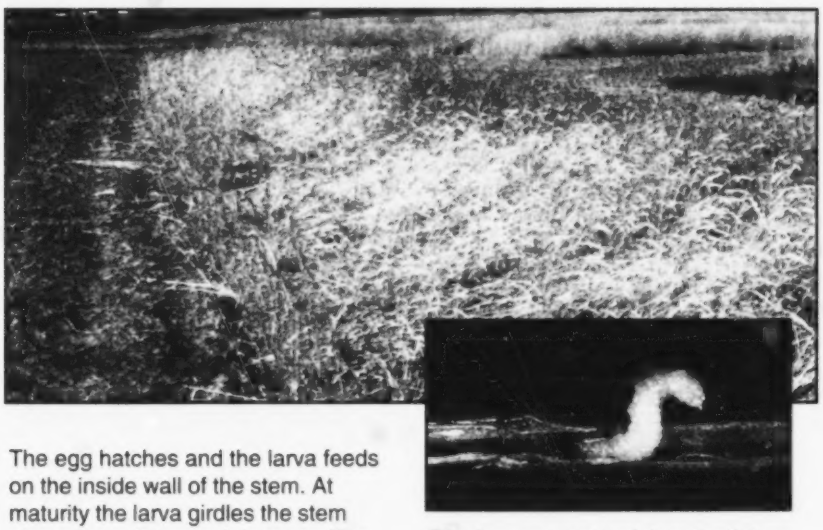
Winter triticale has winter hardiness equal to that of winter wheat. **Pika** and **Bobcat** are the only cultivars of winter triticale available. **Bobcat** is awnletted with shorter and stronger straw than **Pika**.

Wheat Stem Sawfly

Area of Infestation: In 2002 sawfly (*Cephus cinctus* Nort.) damage to wheat occurred over a large area of south central Saskatchewan (extending as far north as Unity and Wilkie) and southern Alberta. Sawfly are expected to be a major pest again in 2003.

Symptoms: The wheat appears to be lodged. On close examination, the stems are cut near ground level or detach easily when tugged. A stem split lengthwise reveals an abundance of frass, powdery waste from the sawfly. The subcrown internode contains the sawfly larva in its cocoon.

Life Cycle: To survive the winter, the larva spins its cocoon in the wheat stem below the soil surface. Early June to mid-July the following year, the sawfly emerge as a wasp-like insect. It finds a tender elongating portion of a wheat stem, saws a tiny hole, and deposits an egg inside the stem wall.



The egg hatches and the larva feeds on the inside wall of the stem. At maturity the larva girdles the stem above the sub-crown internode. The larva makes a plug in the stem just below the cut on the stem, and encloses itself in a cocoon.

Damage: Girdling weakens the stem so it easily falls over, making it difficult to harvest which results in a yield loss. Another source of yield loss is from the sawfly feeding on the inside of the stem which reduces the number of seeds per head and seed plumpness.

Sawfly Control:
Resistant Varieties:
CWRS Two solid stem varieties are available, **AC Eatonia** and **AC Abbey**

Sawfly feed easily throughout the length of regular hollow stem varieties. Sawfly resistant varieties have solid stems that are filled with pith, especially in the lower part. The pith slows the movement of the sawfly larvae, many dying before they reach the sub-crown internode. As a result, there is much less cutting in sawfly resistant varieties. The reduction in cutting also depends on the growing season. Formation of pith is depressed when the conditions during stem growth are cloudy. Under those conditions a solid stem variety may have more cutting than desirable.

Considerations for Use of Resistant Varieties
Sawfly resistant varieties are lower yielding than hollow stem varieties.

The farmer must weigh potential income loss from sawfly damage of hollow stem cultivars against the financial loss from growing a lower yielding sawfly- resistant variety.

Alternate varieties: A sawfly resistant wheat variety (solid stemed) may be grown on a field until the sawfly level is reduced, then grow a hollow stem variety until an increase in cutting is observed.

Border Planting of Resistant Variety
Sawfly inhabit the native grasses in uncultivated areas around a field. If the source of sawfly is adjacent uncultivated land or an adjacent wheat field, a border of a sawfly resistant variety may be planted around a field containing a non-resistant variety. The border should be from the same wheat class. The sawfly is a weak flyer so most will lay their eggs in this border strip which reduces the damage to the non- resistant variety.

Mixtures of resistant and non-resistant wheat varieties may be tried. In recent years, durum wheat was cut almost as severely as hollowed stemmed wheat in some areas.

Agronomic Practices:
Sawfly damage can be reduced by:

- crop rotations with non-host crops such as lentils, peas, canola,mustard, oats, barley and rye. Barley and rye can be slightly infected.
- swathing before the stems are cut
- using pick-up reels
- delayed planting

Insecticide: Insecticides are not practical for effective control of sawfly.

Parasite: The natural parasite, Bracon cephi, eats the larvae. A build-up of the parasite reduces sawfly damage and plugs available for the next growing season. The problem is that the parasite takes a couple of seasons to build up, while the sawfly damage is already taking its toll.

Websites:
www.gov.mb.ca/agriculture/crops/insects/fad20s00.html
http//itsd-s3.agric.gov.ab.ca/pests/insects/62010240.html
www.agr.gov.sk.ca

Malting Barley

Main characteristics of varieties

Category♣ and variety	Years Tested	2 or 6 row	Rough or smooth awns	—Yield as % of Harrington— Area 1	Area 2	Area 3	Area 4	Relative maturity rating *	Straw ‡	Resistance to Lodging	Net Blotch	Scald	Loose Smut	Other smuts	Root Rot	Stem Rust	Fusarium ♦ Head Blight
Malting acceptance: Recommended																	
Harrington	15	2	R	100	100	100	100	M	N	F	VP	P	P	P	F	P	F+
CDC Kendall	10	2	R	101	112	114	118	M	N	G	F	P	P	P	F	G	F
Merit	8	2	R	107	124	125	125	L	N	F	F	P	P	G	F	G	F
AC Metcalfe	10	2	R	102	110	112	115	M	N	G	F	P	VG	F	F	G	F
CDC Stratus	10	2	R	101	114	118	120	M	N	G	F	P	F	F	F	G	F
Stein	15	2	R	105	107	113	115	M	N	F	F	P	P	G	P	G	F
B1602	11	6	R	89	107	107	116	M	N	G	F	P	P	G	VG	G	VP
Excel	8	6	S	102	113	119	119	M	N	VG	F	P	P	G	G	G	VP
Legacy	4	6	S	110	112	108	124	M	N	G	F	P	P	F	G	G	P
Robust	7	6	S	88	105	111	108	M	N	G	F	P	P	F	G	G	VP
CDC Sisler	8	6	S	100	110	119	118	M	N	F	P	P	P	P	F	G	F
Malting acceptance: Under test																	
AC Bountiful	9	2	R	105	115	121	118	M	N	G	G	P	VG	VG	F	G	F+
Calder●	3	2	R	—	129	116	—	M	N	F	G	F	VG	VG	F	G	F
CDC Copeland	6	2	R	109	119	123	124	M	N	G	F	P	P	F	F	F	F+
CDC Goodale●	3	2	R	—	122	115	—	M	N	F	F	P	G	G	F	F	F
Newdale●	4	2	R	118	125	123	127	M	N	G	F	P	P	F	F	G	F
CDC Select	5	2	R	104	117	115	122	M	N	G	F	P	F	F	F	F	P
CDC Battleford	4	6	S	110	124	118	133	M	N	G	G	P	VP	G	F	G	P
CDC Tisdale●	4	6	S	107	115	107	117	M	N	G	G	P	P	G	F	G	VP
CDC Yorkton	6	6	S	99	114	121	130	M	N	G	G	P	P	G	F	G	P

* Relative maturity: The relative maturity of the check, Harrington, is M (on average, 91 days from seeding to swathing ripeness)

‡ N = normal, SD = semi-dwarf,

♣ These categories are established annually by the Canadian Malting Barley Technical Centre (Call 204-984-4399 for more information)

♦ F+ indicates that these lines have superior resistance to those rated F but not enough to rate G

Lines Under Evaluation of Malting and Brewing Quality

Small scale tests are a good measure of malting potential but are not sufficient to determine the commercial acceptability of malting varieties. Final acceptance is given only after two years of successful plant scale evaluation. Several carload lots of barley are malted and subsequently brewed. The beer is then given the ultimate test – a taste panel. This process will normally take a minimum of three years. A crop grown in 2003 will be malted in January-February, 2004. It will be brewed in May-June, 2004, aged and tasted in October-November 2004.

Additional Information:

Growers are reminded that the industry is cautious about using new varieties.

Growers are cautioned that malting varieties, especially two rows, are very susceptible to sprouting.

103-02736/

Recommended Malting Barley Varieties 2003-04

From the Canadian Malting Barley Technical Centre

These recommendations are based on the varieties expected to be selected by grain and malting companies for both domestic and export markets. Seeding decisions should be based on agronomic considerations and feedback from your grain company representative and local elevator operators. This list is published on behalf of the member companies of the CMBTC, and other companies that have provided their input. Varieties not listed are not recommended.
Consult your provincial agriculture representative and talk to your elevator manager about local market demand for particular varieties.

Recommended TWO-ROW Barley Varieties

Variety	Comments
AC Metcalfe	Widely accepted domestically and for export
Harrington	Established demand, but other varieties have superior agronomic characteristics
CDC Kendall* (AU & SWP)	Expanding domestic and export markets
Stein* (AU)	Established export markets
CDC Stratus	Established domestic markets
Merit	Limited domestic markets; expanding export markets

The varieties AC Bountiful (TR 243), CDC Copeland (TR 150), Calder (TR 262), CDC Select (TR 153), and Newdale (TR 258) are not being grown for the commercial market. Limited quantities are being grown for market development and testing purposes. B1202 has limited domestic markets.

Recommended SIX-ROW Barley Varieties

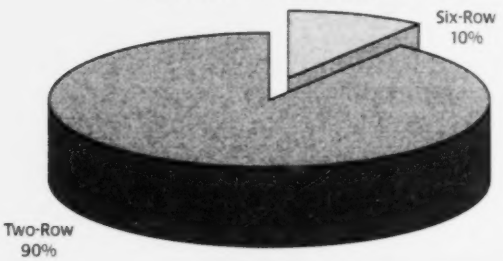
Variety	Comments
Robust	Established demand
Excel	Established demand
B1602* (AU, SWP)	Established demand
CDC Sisler* (AU)	Growing domestic demand
Legacy	Growing domestic and export demand

The varieties CDC Yorkton (BT 459), CDC Battleford (BT 456), CDC Tisdale (BT 462), and Lacey are not being grown for the commercial market. Limited quantities are being grown for market development and testing purposes.
"Domestic" as used in this publication, means barley selected for domestic processing into malt.

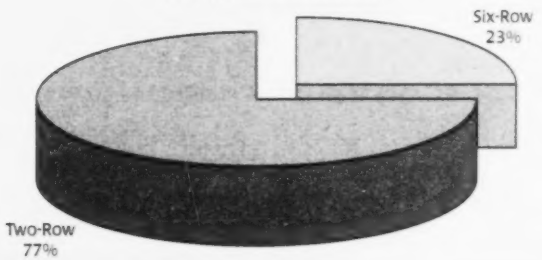
* These varieties are proprietary to the companies listed.

The CMBTC recommends the use of certified seed to ensure varietal purity

Varieties selected for domestic use, 2001-02
(1,069,000 tonnes delivered)



Varieties selected for export, 2001-02
(1,136,000 tonnes delivered)



CMBTC Member Companies

Agricore United, Busch Agricultural Resources-Canada, the Canadian Wheat Board, the Canadian Grain Commission, Canadian International Grains Institute, Dominion Malting, Quality Assured Seeds, the Public Plant Breeders, Saskatchewan Wheat Pool, SeCan, Westcan Malting.

Other organizations providing input to this list: Cargill, ConAgra Grain

QUESTIONS? Call your selector or handling company, the CWB, or contact the CMBTC at 204-984-4399 (cmbtc@cmbtc.com)

Feed and Food Barley

Main characteristics of varieties

Category and variety	Years Tested	2 or 6 row	Rough or smooth awns	— Yield as % of Harrington — Area 1	Area 2	Area 3	Area 4	Relative maturity rating *	Straw ‡	— Resistance to — Lodging	Net Blotch	Scald	Loose Smut	Other smuts	Root Rot	Stem Rust	Fusarium Head Blight ♦
Feed																	
CDC Dolly	9	2	R	106	114	117	117	M	N	G	P	G	P	G	F	G	F+
CDC Fleet	10	2	R	89	97	101	102	VE	N	VG	F	G	P	VP	P	G	F+
CDC Helgason	5	2	R	107	117	119	120	M	N	G	G	P	VG	G	F	F	P
Niobe●	3	2	R	—	111	106	—	M	N	F	F	P	P	G	P	G	F
Xena	6	2	R	113	127	133	129	M	N	G	F	P	P	VG	F	G	F
AC Harper	10	6	S	107	116	121	117	M	N	G	F	G	P	F	F	G	VP
AC Lacombe	12	6	S	101	117	120	121	M	N	G	F	F	P	VG	F	G	VP
AC Rosser	10	6	S	114	129	131	134	M	N	G	F	VP	P	VG	G	G	VP
Stander	10	6	S	94	116	124	128	M	N	VG	F	P	P	P	G	G	VP
Trochu●	5	6	S	97	119	119	136	M	N	F	P	F	P	G	G	G	VP
Hulless																	
CDC Dawn	10	2	R	96	105	121	104	M	N	F	F	G	P	F	F	G	F+
CDC Freedom	8	2	R	90	100	104	102	M	N	G	F	P	—	G	P	G	F+
CDC Gainer	9	2	R	87	96	100	101	M	N	F	F	G	P	F	F	G	F
HB 805	4	2	R	95	108	113	108	L	N	F	F	P	F	G	F	F	n/a
CDC McGwire	7	2	R	97	111	112	114	M	N	G	VG	G	P	G	G	F	F
Phoenix^	10	2	R	82	93	88	—	M	N	G	P	P	P	F	G	P	F+
CDC Speedy^	4	2	R	73	91	103	93	VE	N	G	F	G	P	P	F	G	F+
Tercel	9	2	R	90	95	98	99	M	N	F	P	P	P	F	F	G	P
AC Bacon	8	6	R	92	107	109	110	M	N	G	P	G	P	F	F	G	F
Falcon^	10	6	S	70	90	88	95	M	SD	VG	F	G	P	F	F	G	VP
Peregrine	6	6	R	71	80	87	90	M	SD	VG	F	F	P	P	G	G	VP
Intensive Management																	
CDC Bold	5	2	R	114	125	128	131	L	SD	G	P	G	P	VG	G	G	P
CDC Thompson^	10	2	R	89	98	97	101	VE	SD	VG	F	G	F	F	F	G	F
CDC Earl	10	6	R	99	111	110	120	L	SD	VG	G	G	P	G	G	G	VP
Kasota	8	6	S	97	106	109	108	E	SD	G	F	G	P	G	P	G	VP
Mahigan	8	6	S	106	112	114	115	E	SD	VG	F	G	P	G	P	G	VP
Niska	6	6	S	105	120	123	129	L	SD	F	P	P	P	G	P	G	VP
Vivar	5	6	R	114	119	115	133	L	SD	G	F	P	F	G	F	G	VP

* Relative maturity: The relative maturity of the check, Harrington, is M (on average, 91 days from seeding to swathing ripeness)

‡ N = normal, SD = semi-dwarf,

♦ F+ indicates that these lines have superior resistance to those rated F but not enough to rate G

Forage Barley

AC Ranger, **AC Hawkeye**, and **Westford** are six row varieties marketed as forage barley.

Hulless

In hulless varieties the hull is left in the field, therefore, comparable yields are 9-12 percent lower. Hulless seed is more susceptible to damage than hulled seed, so handling should be minimized.

Hulless Waxy

CDC Alamo, **CDC Candle**, **HB803** and **Merlin** are waxy starch varieties for specialty markets. For further information contact Agricore United.

Feed and Food Barley (Cont'd)

Irrigation
Under irrigation, disease resistance, straw strength and maturity are more critical. Growers should select early, strong-strawed, disease resistant varieties and should consider semi-dwarf varieties.

General Comments
A race of stem rust which attacks all of our previously resistant varieties is present in the eastern prairies and the northern great plains. This race has not reached high levels but if conditions are favorable, it could become a problem. Early sowing is the only practical measure which can be taken at this time.

Of the current two-rowed varieties, only **CDC McGwire** has good field resistance to all races of net blotch. Therefore, growers who must plant barley on barley stubble should either select six-rowed varieties which are more tolerant or the above mentioned two-rowed variety.

Most of the available varieties are susceptible to one or more types of smut. Therefore, seed should be treated on a regular basis.

Harvesting grain over 16 percent moisture and then using aeration bins for drying can lead to sprouting and embryo death. Seed with reduced germination is undesirable for seeding or malting purposes.

Two-rowed barley varieties are generally more resistant to shattering than are six-row varieties.

Oat

Main characteristics of varieties

Variety	Years Tested	Area 1	Area 2	Area 3	Area 4	Test wt. (g/0.5L)	% Hull	% Plump	Maturity Rating*	Resistance to Lodging	Resistance to Stem Rust	Resistance to Leaf Rust	Resistance to Smut
Calibre	13	100	100	100	100	250	22.9	44	M	G	VP	VP	P
AC Assiniboia	11	92	99	95	95	240	22.9	74	M	VG	VG	VG	VG
Boudrias#	4	80	88	89	91	263	NA	16	L	G	VG	VG	VG
CDC Boyer	11	99	104	100	99	236	22.6	81	E	G	VG	F	P
CDC Dancer	5	99	103	100	100	257	19.2	80	M	G	VG	VP	VG
Derby	13	100	101	103	103	251	22.2	74	M	G	VP	VP	P
SW Exactor	6	97	108	105	101	241	25.0	44	L	VG	VP	VP	F
AC Gwen#	5	67	74	76	70	278	NA	11	L	G	VG	VG	VG
Kaufmann	5	93	98	97	90	250	22.1	85	L	F	VG	VG	VG
AC Morgan	6	102	112	110	111	242	24.2	63	M	VG	VP	VP	F
CDC Orrin	4	103	109	115	109	257	22.5	81	L	G	VP	VP	VG
CDC Pacer	9	101	109	108	103	245	23.7	71	M	G	VP	VP	F
Pinnacle	6	108	117	110	108	245	23.1	80	VL	G	G	VG	VG
Ronald	5	91	99	98	100	253	21.8	62	L	VG	VG	VG	VG
Triple Crown	9	95	105	108	108	238	24.7	67	L	VG	VP	F	P

* Maturity rating: M = 96 days
# Hulless variety

Additional information:
AC Assiniboia has brown hulls.
HULLESS OAT: The hull is part of normal oat yield, thus hulless types yield less. They are difficult to handle and should be stored at less than 12 per cent moisture.
CDC Baler, CDC Bell, and Murphy are annual forage oat varieties available for production in Saskatchewan.

Other Crops

Canary Seed

The seed of annual canarygrass, more commonly called canary seed, is used as food for caged and wild birds. Three registered varieties are available. **Elias** and **Keet** are similar in yield, but *Keet* is earlier maturing and more resistant to lodging. Seeds and plants of **CDC Maria** do not have the small sharp hairs that cause irritation when canary seed is threshed and handled. Canary seed plants have a dense shallow root system and growing the crop on sandy soils is therefore not recommended. Canary seed may be grown successfully on stubble, providing adequate moisture is available for rapid germination and emergence. The maturity requirements are equal to wheat.

Planting should occur at the same optimum date as spring wheat at 34 kg/ha (30 lb/ac) (germination greater than 85 per cent). Early seeding may lower yields in some cases. Plant the seed 3.5 to 5 cm deep into a firm seedbed.

Fertilizer requirements are similar to those for cereal crops.

Canary seed is subject to damage by English grain aphid and bird cherry-oat aphid. Aphid populations build up rapidly on leaves, stems and head of the plant in August and may require an insecticide application to prevent yield loss. Information from the United States indicates that infestations of 10 to 20 aphids on 50 per cent of the stems prior to soft dough stage may cause enough damage to warrant insecticide application. The aphids often hide in the dense head of canary seed. Damage may occur at populations below these levels.

Canary seed leaf mottle is a foliar disease that can cause yield losses. Leaf mottle is caused by a fungus, *Septoria triseti*, that only affects canary seed. The disease is inconspicuous at early stages because there is little visual contrast between healthy and diseased leaf area. Stubble borne inoculum is the source of infection, thus crop rotation is key in limiting the severity of leaf mottle.

Canary seed should not be seeded on land that was treated with trifluralin or ethalfluralin the previous year.

Canary seed is resistant to shattering. It may be straight-combined or swathed when fully matured.

For more information on canary seed, consult the SAFRR publication, *Canary Seed in Saskatchewan.*

Safflower

Safflower is an annual oilseed or birdseed crop which can be grown successfully in the Brown soil zone. Safflower must be sown early (late April).

Saffire matures in about 120 days. Seed shallow but into a firm moist seedbed at about 30 kg/ha (27 lbs/ac). **Saffire** has moderate resistance to Sclerotinia head rot and Alternaria leaf spot. Contract production is advisable.

AC Stirling has acceptable birdseed quality and higher oil content compared to **Saffire**. **AC Sunset** has the earliness of **Saffire** combined with higher oil content and resistance to Sclerotinia head rot.

Buckwheat

Buckwheat is sensitive to high temperatures and dry weather conditions in the blossom stage which can reduce seed set and yields. New self-pollinated varieties are being released. Buckwheat is very susceptible to frost at all stages of growth. Delayed seeding is advisable to avoid spring frost.

Caraway

Caraway is a biennial spice crop, producing seed in the second year and sometimes in the third year. Seedlings are small, slow in developing and compete poorly with weeds. The crop is usually swathed because of its indeterminate growth habit and seed shattering. For more information, consult the SAFRR publication, *Caraway in Saskatchewan.*

Fenugreek

Fenugreek is a leguminous spice crop adapted to dryland conditions in the Dark Brown and Brown soil zones. The crop should be seeded early to avoid yield and quality loss from fall frost. Contract production is advisable, as markets are limited.

Coriander

Coriander is an annual spice crop. Seedlings are small, slow to develop, and compete poorly with weeds. The large seeded type is earlier maturing than the small seeded type. **CDC-Major** is a large-seeded coriander variety and **CDC-Minor** is a small-seeded variety. The crop is usually straight-cut to avoid wind damage to swaths. For more information consult the SAFRR publication, *Coriander in Saskatchewan.*

Oilseed Crops

Argentine Canola

Main characteristics of varieties

Variety	— Yield as a % of AC Excel (years in test) — Area 2	Area 3	Area 4	Average % Oil*	Average Maturity In Days	— Resistance To — Lodging	Blackleg**	Varietal Kind***	Herbicide Tolerance****
AC Excel	100 (7)	100 (7)	100 (7)	46.8	98	G	F	OP	—
1492	118 (4)	125 (5)	123 (4)	45.8	99	VG	F	HYB	—
1604	115 (3)	—	—	49.3	101	VG	G	OP	CL
1812	111 (4)	120 (3)	—	47.4	100	G	G	S	RR
215CL	—	100 (3)	—	48.4	100	G	F	OP	CL
23-38●	103 (4)	107 (3)	—	47.9	97	G	G	OP	RR
243CL	—	99 (3)	—	47.0	100	G	F	OP	CL
2573	130 (5)	139 (4)	129 (3)	47.6	97	VG	VG	HYB	LL
2663	126 (5)	137 (4)	150 (3)	48.3	96	G	VG	HYB	LL
2733	123 (3)	130 (3)	—	48.4	95	G	G	HYB	LL
289CL	—	110 (3)	—	47.4	98	G	VG	OP	CL
3235	104 (6)	103 (6)	102 (4)	46.6	96	G	G	OP	RR
34-55●	108 (4)	114 (4)	113 (3)	47.8	99	VG	G	OP	RR
35-85●	114 (3)	120 (3)	—	47.1	102	G	VG	OP	RR
45A51	110 (3)	109 (3)	115 (3)	45.8	102	G	F	OP	RR
45A54	114 (3)	102 (3)	—	46.1	97	G	VG	OP	RR
45A55	108 (4)	120 (4)	101 (3)	46.7	96	G	VG	OP	RR
45H21	130 (3)	153 (3)	142 (3)	48.2	97	G	VG	HYB	RR
46A65	112 (6)	114 (7)	115 (5)	47.5	98	F	VG	OP	—
46A73	101 (3)	115 (3)	—	46.2	102	G	G	OP	CL
46A76	134 (3)	128 (3)	—	46.9	100	VG	VG	OP	CL
499RR	102 (4)	122 (4)	—	47.3	98	G	VG	HYB	RR
505RR	—	139 (3)	—	48.1	100	VG	VG	HYB	RR
519RR	—	129 (3)	—	48.0	100	VG	VG	HYB	RR
811RR	114 (3)	130 (3)	—	47.7	98	G	VG	OP	RR
Agassiz	103 (4)	108 (4)	107 (3)	44.0	102	G	F	OP	—
Ascent	99 (4)	108 (4)	—	46.8	98	G	F	OP	—
Canterra 1867	93 (3)	103 (4)	—	46.7	97	G	F	OP	RR
Conquest	103 (3)	106 (3)	—	46.8	98	VG	VG	OP	RR
DS-Roughrider●	100 (5)	107 (5)	97 (3)	49.3	98	G	F	OP	RR
EAGLE	—	114 (3)	—	45.6	97	G	G	OP	—
Foremost	131 (4)	117 (3)	—	47.4	101	VG	VG	OP	—
Heritage	95 (3)	99 (4)	—	45.4	97	F	G	OP	RR
Hi-Q	114 (3)	111 (3)	—	46.8	99	VG	VG	OP	—
Hudson	117 (3)	116 (3)	—	45.5	96	G	G	OP	—
HYLITE 225RR	106 (4)	109 (4)	105 (3)	48.1	97	G	G	OP	RR
Hyola 401	102 (3)	121 (3)	107 (3)	44.0	98	G	P	HYB	—
HY-PER Star 100	113 (5)	119 (6)	121 (3)	45.8	100	VG	G	HYB	—
IMPULSE	108 (3)	121 (4)	112 (3)	45.3	100	G	VG	OP	—
Kelsey	91 (3)	101 (3)	—	47.8	97	G	G	OP	RR
279	—	109 (3)	—	48.5	99	G	G	OP	—
561RR	97 (3)	109 (3)	—	46.8	98	G	G	OP	RR
LBD612RR	112 (3)	130 (3)	—	47.8	98	G	G	OP	RR
799RR	103 (3)	114 (3)	—	46.3	99	G	G	S	RR
LoLinda	—	96 (3)	—	45.7	99	G	G	OP	—
Prairie 715RR	97 (3)	—	—	47.0	98	G	VG	OP	RR
Q2	106 (5)	117 (5)	106 (5)	46.0	102	G	VG	OP	—
Sentry	97 (5)	101 (5)	—	44.4	98	G	VG	OP	—
Skyhawk	—	122 (3)	—	44.9	97	G	VG	OP	—

Argentine Canola (continued)

Main characteristics of varieties

	—Yield as a % of AC Excel (years in test) —				Average	—Resistance to —		Varietal	Herbicide
	Area	Area	Area	Average	Maturity				
Variety	2	3	4	% Oil*	In Days	Lodging	Blackleg**	Kind***	Tolerance****
SP Admirable RR	105 (3)	136 (4)	122 (3)	46.0	100	VG	G	S	RR
SP Armada	90 (3)	120 (4)	95 (3)	47.2	98	VG	VG	OP	—
SP Banner ◘	—	128 (3)	—	48.2	98	VG	VG	OP	RR
SP Bucky ◘	—	110 (3)	—	48.8	99	F	VG	OP	RR
SW 5001	115 (3)	122 (3)	—	46.0	101	VG	VG	HYB	—
SW ARROW ◘	105 (3)	108 (4)	—	44.2	97	F	F	OP	RR
SW GladiatoRR	—	121 (3)	115 (3)	45.4	97	VG	G	S	RR
SW RazoR	—	125 (3)	—	45.2	98	VG	G	S	RR
SW RideR	108 (3)	121 (3)	116 (5)	45.9	99	G	F	S	RR
Thunder	101 (3)	106 (3)	—	46.3	99	G	G	OP	—

* Dry basis

** A minimum of three years between canola crops (four year rotation) is essential to reduce the incidence of blackleg.

*** OP = open-pollinated; HYB = hybrid; S = synthetic

**** Herbicide tolerance: RR = Roundup Ready, LL = Liberty Link, CL = Clearfield.

Note: In most instances, only new varieties are tested each year. Therefore, comparisons should only be made between the check variety (**AC Excel**) and the variety of interest.

Polish Canola

Main characteristics of varieties

	— Yield as % of AC Parkland (years in test) —				Average	—Resistance to —		Varietal
	Area	Area	Area	Average	Maturity			
Variety	2	3	4	% Oil*	in Days	Lodging	White rust	Kind**
AC Parkland	100 (9)	100 (10)	100 (8)	44.3	85	G	VG	OP
1007	104 (3)	106 (3)	—	44.5	85	VG	G	S
1000 SP	102 (3)	98 (4)	—	44.4	84	F	G	S
41P55	108(6)	111 (6)	110 (5)	42.9	84	F	F	OP
ACS-C7	99 (3)	108 (4)	—	44.8	85	F-G	VG	S
AC Sunbeam	102 (9)	104 (9)	106 (8)	43.6	83	G	VG	OP
Cash	97 (3)	109 (3)	110 (3)	43.9	84	G	F	S
FAIRVIEW	104 (3)	107 (3)	—	44.3	85	G	G	S
Hysyn 110	108 (7)	111 (7)	119 (7)	43.0	84	G	F	S
Hysyn 111	105 (4)	107 (5)	116 (3)	42.8	86	G	G	S
Reward	104 (9)	103 (10)	102 (8)	44.4	84	F	VG	OP
WESTWIN	105 (3)	109 (3)	106 (3)	44.6	84	G	G	S

* Dry basis

** OP = open-pollinated; S = synthetic

Note: In most instances, only new varieties are tested each year. Therefore, comparisons should only be made between the check variety (**AC Parkland**) and the variety of interest.

A minimum of three years between canola crops (four year rotation) is essential to reduce the incidence of blackleg.

Additional Information:

Argentine Canola

Argentine varieties mature two weeks later than Polish varieties and are therefore better suited to the mid- and long-season growing areas of Saskatchewan. Argentine varieties yield more than Polish varieties. Blackleg disease, which is now wide spread in Saskatchewan, can cause severe yield losses in varieties that have poor (P) resistance. Argentine varieties are susceptible to seed shattering when left standing at full maturity. Later maturing varieties tend to produce higher levels of green seed under wet and cool conditions at harvest, which can cause substantial grade reductions. Late maturing varieties should therefore be planted early to reduce green seed counts. All Argentine varieties are susceptible to Sclerotinia stem rot. The control of herbicide tolerant canola volunteers requires good agronomic practice such as proper crop and herbicide rotation. Please note that only new varieties are tested each year and therefore most varieties have not been tested in the same year. Varietal comparisons should therefore ONLY be made between the check variety (**AC Excel**) and the variety of interest.

Canola (continued)

Polish Canola
Polish varieties mature approximately two weeks earlier than Argentine varieties and are therefore less likely to produce green seed. Polish varieties are more heat and drought tolerant than Argentine varieties. They are also more shatter resistant than Argentine varieties and are therefore well suited to straight combining. All Polish varieties are susceptible to Sclerotinia stem rot. **ACS-C7** has fair (F) resistance to blackleg; all other Polish varieties have poor (P) resistance. Blackleg is less of a threat in Polish canola because of its early maturity, which tends to reduce the impact of the disease on seed yields. Please note that only new varieties are tested each year. Therefore most varieties have not been tested in the same year. Varietal comparisons should therefore ONLY be made between the check variety (**AC Parkland**) and the variety of interest.

***Brassica juncea* Canola**
Brassica juncea canola is a new class of canola that is adapted to the brown and dark brown soil zones (Areas 1 and 2). It has very good resistance to blackleg and exhibits better heat and drought tolerance than other canolas.

B. juncea canola has shattering resistance similar to Polish canola. Currently all production is contracted and only two varieties are available: **Arid** and **Amulet**.

Specialty Oil Rapeseed and Canola
Argentine type, high erucic acid rapeseed (HEAR) varieties have been developed for special industrial oil markets. These varieties can be lower yielding than conventional open-pollinated canola varieties but have very good blackleg resistance. Low linolenic acid Argentine type canola varieties have also been developed as a premium vegetable oil for human consumption. Information on the contract production of these specialty oil rapeseed and canola varieties should be obtained from companies that contract such production.

Irrigation
Argentine varieties respond well to irrigation. Only varieties that are highly resistant to lodging and blackleg should be grown under these conditions. Irrigation may delay maturity by one week or more under certain conditions.

Mustard

Main characteristics of varieties

Type & Variety	Years Tested	Yield as % of AC Pennant	Protein % seed	Mucilage[1] cS*ml g^{-1}
Yellow				
AC Pennant	12	100	34.6	35.6
AC Base	9	101	34.4	33.2
Tilney	12	95	35.0	38.9
Viscount	12	92	35.3	43.8
Andante	4	98	35.4	46.2

Oriental	Years Tested	Yield as % of Cutlass	Fixed oil % seed	Volatile oil[2] mg g^{-1} seed
Cutlass	21	100	41.3	9.9
Forge	17	96	38.6	10.3
AC Vulcan	12	101	40.8	11.0
Brown				
Commercial	21	92	37.9	8.6
Duchess●	5	93	38.1	8.5

[1] mucilage in centi Stoke per 1g seed
[2] volatile oil as allyl isothiocyanate

Seed quality data based on three years of testing for yellow mustard and four years for oriental and brown mustard.

Additional Information:

Mustard is grown in the drier regions of Saskatchewan due to the better seed quality obtained under these conditions. Saskatchewan is the primary producer of mustard in Canada and produces condiment mustard for export around the world. Oriental and brown mustard (*Brassica juncea*) are usually swathed when at least 25 per cent of the seeds have begun to change colour.

Straight combining is also possible, as both types of mustard have good seed shatter resistance. Straight combining is preferred for yellow mustard, *Sinapis alba*, as the stubble is usually shorter and does not anchor the lighter, fluffy swaths. It is important to check for proper seed maturity, as green seed is a major downgrading factor. Yellow mustard varieties mature in approximately 90 to 92 days, brown varieties in 85 days and oriental varieties mature in 86 to 88 days. Top grades of mustard are obtained when seeds are well matured; have good colour, with minimal damage; and are free of seeds from volunteer canola plants and weed seeds such as cow cockle.

Mustard is generally grown under contract, with varieties specified by the contracting companies to meet specific quality requirements for processing. Yellow mustard has a high protein content with newer varieties (**Viscount** and **Andante**) also having high mucilage content. **Forge** and **AC Vulcan** have high volatile oil content, a desirable trait for oriental mustard, as is the low fixed oil content. The brown mustard variety **Duchess** was registered in 2002. Average yields of yellow mustard were 17 per cent lower than oriental mustard yields over 12 years of testing from 1991-2002. Differences in seed yield between the different types of mustard are normally compensated for by price.

All mustard varieties have very good resistance to blackleg disease. The oriental type varieties **AC Vulcan** and **Cutlass** are resistant to white rust (staghead) while **Forge** and the brown mustard varieties **Commercial Brown** and **Duchess** are highly susceptible.

Sunflower

Main characteristics of varieties

Oilseed

Variety	Years Tested	Yield as % of IS 6111	Average Maturity in days	Oil %*
IS 6111	12	100	122	46.5
63A70	4	110	124	49.5

* Dry basis

Oilseed (EMSS)

Variety	Years Tested	Yield as % of P6150	Average Maturity in days	Oil %*
P6150	10	100	113	46.6
63A21	4	112	114	47.2

Confection

Variety	Years Tested	Yield as % of IS 6111	Average Maturity in days	Seed size % over 20/64
IS8048	4	94	125	61.2

Additional Information:

Sunflower requires 105-125 days to mature, depending on the cultivar and the growing season. Oilseed sunflower has been grown in the Dark Brown and Black soil zones in southeastern Saskatchewan.

The earlier maturing, short stature (EMSS) varieties are adapted to production in most areas of Saskatchewan.

The Saskatchewan Sunflower Committee has been conducting trials in Saskatchewan for the purpose of registration and demonstration since 1983.

Varieties that have been tested in official Saskatchewan Sunflower Committee trials for three years and are registered for production in Canada are placed on this list.

The Committee has been testing NuSun, a sunflower with a fatty acid profile desired by major frying companies. There will be additional acres of oilseed sunflower required to address the increased birdseed market.

Flax

Main characteristics of varieties

Variety	Years tested	Yield as a % of Vimy — Area 1	Area 2	Area 3	Area 4	Irrigation	Maturity**	Seed size	Resistance to Lodging
Vimy	16	100	100	100	100	100	M	L	P
CDC Arras	8	104	106	104	104	103	M	L	F
CDC Bethune	8	112	117	114	116	111	L	M	G
AC Carnduff	7	84	92	101	93	112	M	M	G
AC Emerson	8	96	96	95	93	98	M	L	F
Flanders	11	94	98	96	99	108	L	S	G
AC Hanley	5	—	98	99	—	—	M	M	G
AC Lightning	6	101	102	107	91	111	L	M	G
Macbeth	5	—	97	96	—	111	L	M	G
AC McDuff	7	93	95	97	94	102	VL	M	VG
CDC Mons	4	—	103	112	—	—	L	S	G
NorLin	16	91	96	96	99	105	M	M	G
CDC Normandy	8	99	100	101	104	105	M	M	F
Somme	10	94	97	98	97	109	M	M	F
Taurus	6	98	102	110	—	115	M	M	G
CDC Valour	6	98	103	94	95	93	E	M	G
AC Watson	6	94	97	102	102	104	M	M	G
Solin									
1084	6	93	94	95	106	99	M	M	G
2047	4	—	93	115	—	—	M	M	G

* Data from Regional and COOP Yield Trials.

** Relative Maturity: The relative maturity of the check, Vimy, is M (on average 103 days from seeding to swathing ripeness).

Additional Information:

All varieties are resistant to rust and moderately resistant to Fusarium wilt. **AC Hanley**, **AC Lightning**, **Macbeth**, **CDC Mons** and **Linola ™ 2047** are newly registered varieties. **AC Hanley** is distributed by SeCan Association, **AC Lighting** by Canterra Seeds Ltd., **Macbeth** by AgricoreUnited/Proven Seeds, **CDC Mons** by Quality Assured Seeds and **Linola ™ 2047** by Proven Seeds. No seed is available for **CDC Mons** in 2003.

Solin is defined as a type of flax with less than five per cent linolenic acid in its oil and having a yellow seed coat. Solin varieties produce food quality oil and, as such, cannot be sold in traditional flax markets. **Linola ™ 1084, Linola ™ 2047** are available only for contract production.

Frozen flax should be analyzed by a feed testing laboratory to determine that it is free of prussic acid before using it as a livestock feed.

Pulse Crops

Lentil

Main characteristics of varieties

Market class	Variety	Years tested*	Yield % of Laird — Areas 1-2	Yield % of Laird — Areas 3-4	Height (cm)	Days to flower	Maturity rating	Resistance to — Ascochyta blight	Resistance to — Anthracnose	Cotyledon colour	Seed weight (g/1000)
Large green	Laird	8	100	100	41	53	VL	VP	VP	yellow	67
	CDC Glamis	7	111	106	39	54	VL	G	VP	yellow	60
	CDC Grandora	6	109	110	40	53	VL	G	VP	yellow	69
	CDC Sovereign	6	116	109	40	52	L	G	P	yellow	66
	CDC Sedley	5	118	106	39	51	M	F	VP	yellow	68
	CDC Plato	4	130	120	38	52	ML	G	P	yellow	64
Medium green	CDC Richlea	7	133	111	35	50	M	VP	VP	yellow	51
	CDC Vantage	7	134	123	33	49	M	G	VP	yellow	52
Small green	Eston	7	116	103	30	48	E	VP	VP	yellow	33
	CDC Milestone	8	136	124	31	49	E	G	VP	yellow	37
French green	CDC LeMay	4	120	115	35	48	E	F	VP	yellow	32
	common	4	116	109	32	49	E	P	VP	yellow	31
Small red	Crimson	5	118	109	29	49	E	VP	VP	red	35
	CDC Blaze	4	124	115	30	47	E	G	P	red	34
	CDC Redcap	6	127	115	30	49	E	G	F	red	35
	CDC Redwing	6	122	112	30	50	E	G	VP	red	38
	CDC Robin	5	136	113	30	49	E	G	G	red	30

* Coop and Regional Trials in Saskatchewan since 1995. Direct comparisons to Laird.

Additional Information:

Indianhead lentil is a black-seeded variety released for green manure use. **CDC Matador** is a brown-seeded variety with yellow cotyledons. Seed supplies are limited for **CDC LeMay** and **CDC Plato.**

Detailed agronomic information may be found in the **Pulse Production Manual** available from the Saskatchewan Pulse Growers.

Dry Bean

Main characteristics of varieties

Variety	Type	Years tested*	Yield as % of CDC Pintium — Irrigation	Yield as % of CDC Pintium — Area 2	Yield as % of CDC Pintium — Area 3	Days to flower	Maturity	Pod clearance (%)	Seed weight (g/1000)	Growth** habit
CDC Pintium	pinto	6	100	100	100	50	E	80	350	I
Othello	pinto	6	96	96	89	52	L	51	323	III
CDC Pinnacle	pinto	5	102	103	98	53	L	67	352	III
CDC Altiro	pinto	6	102	86	77	47	E	64	357	III
CDC Camino	pinto	6	97	86	76	52	L	81	323	I
CDC Minto	pinto	4	99	—	93	51	L	62	410	III
Earliray	pinto	5	82	89	80	50	E	65	349	I
AC Polaris	great northern	4	106	71	94	52	L	70	310	III
CDC Crocus	great northern	6	104	99	81	47	E	59	355	III
CDC Nordic	great northern	6	77	79	68	52	L	62	319	I
CDC Polar Bear	great northern	4	98	87	77	52	L	65	339	III
US 1140	great northern	6	88	87	81	51	L	53	289	III
CDC Rosalee	pink	4	100	97	85	50	L	65	247	III
Viva	pink	4	94	102	80	51	L	50	242	III
AC Redbond	small red	4	100	97	85	51	L	65	290	II
CDC Expresso	black	6	55	78	66	47	M	87	191	I
CDC Nighthawk	black	5	62	61	67	58	L	77	165	II
UI906	black	5	93	96	71	60	L	76	148	II

* Coop and regional trials grown in narrow rows

** Growth habit: I - determinate bush; II - indeterminate bush; III - indeterminate vine.

Field Pea

Main characteristics of varieties

Variety	Years tested*	Yield % Alfetta: 1,2 & South 3	Yield % Alfetta: North 3 & 4	Yield % Alfetta: Irrigation	Leaf type**	Relative maturity	Vine Length (cm)	Resistance to: Mycos-phaerella blight	Resistance to: Powdery mildew	Resistance to: Seed coat breakage	Resistance to: Lodging	Resistance to: Bleaching	Resistance to: Seed coat dimpling***	Resistance to: Green seed coats****	Seed weight g/1000
Food Type Yellow Seed															
Alfetta	8	100	100	100	SL	M	60	P	P	F	F	n/a	F	G	290
AC Melfort	4	98	86	87	SL	M	70	F	VG	F	F	n/a	G	F	240
Badminton	4	107	102	—	SL	E	65	P	P	G	F	n/a	F	G	250
Carneval	7	89	85	107	SL	M	75	F	P	F	G	n/a	—	—	230
CDC Handel	5	112	99	112	SL	L	75	P	VG	G	F	n/a	G	F	220
CDC Mozart	6	114	106	114	SL	M	70	F	VG	G	F	n/a	G	F	230
CDC Minuet	5	109	108	—	SL	M	70	F	VG	F	F	n/a	G	F	190
Cobra	4	99	94	—	SL	M	75	P	P	G	F	n/a	F	F	240
Croma	5	101	100	—	SL	E	70	P	P	G	F	n/a	G	G	300
Delta	4	101	98	—	SL	E	70	P	P	G	F	n/a	—	—	250
DS Admiral	5	101	110	87	SL	E	80	F	VG	G	G	n/a	G	G	240
DS Stalwarth	4	97	95	103	SL	M	80	P	VG	G	F	n/a	G	G	240
Eclipse	5	111	110	116	SL	M	80	F	VG	G	G	n/a	F	G	250
Grande	7	93	91	93	N	L	90	F	P	G	F	n/a	G	F	220
Integra	4	85	100	—	SL	E	75	F	P	G	G	n/a	F	F	280
Mandy	4	88	94	96	SL	M	60	P	P	F	F	n/a	—	—	270
Miami	5	102	102	—	SL	E	80	P	P	F	G	n/a	G	F	240
Nicole	4	106	105	—	SL	M	65	P	P	F	F	n/a	G	G	260
SW Belfield	3	113	127	117	SL	E	70	P	P	F	F	n/a	F	G	220
SW Bravo	4	88	95	—	SL	E	75	F	P	G	G	n/a	G	G	260
SW Circus	3	107	120	108	SL	E	75	F	P	F	G	n/a	F	G	220
SW Capri	4	102	108	—	SL	E	75	F	P	F	G	n/a	F	G	210
SW Prize	3	102	108	—	SL	E	80	F	P	G	G	n/a	G	G	240
SW Salute	4	114	115	—	SL	E	75	P	VG	F	F	n/a	F	F	220
SWING	5	95	99	—	SL	E	75	F	P	VG	G	n/a	G	G	250
Food Type Green Seed															
AC Advantage	4	79	68	—	SL	L	60	F	VG	G	P	F	F	n/a	270
CDC Montero	5	99	95	—	SL	M	80	F	VG	G	F	F	F	n/a	230
CDC Striker	3	101	97	—	SL	M	80	F	P	VG	G	G	G	n/a	230
CDC Verdi	5	90	73	—	SL	L	75	F	P	G	F	G	F	n/a	200
Cruiser	4	91	87	—	SL	M	75	F	P	VG	F	G	G	n/a	200
DS Dominator	3	86	67	—	SL	L	65	F	VG	G	G	F	F	n/a	230
Espace	4	96	101	—	SL	M	75	P	P	F	G	F	F	n/a	230
Logan	4	85	86	—	SL	E	75	P	P	F	G	G	F	n/a	180
Madoc	5	95	98	104	SL	E	70	P	P	F	F	F	F	n/a	250
Majoret	5	79	75	95	SL	M	60	P	P	G	G	F	—	n/a	250
Millenium	5	103	97	—	SL	E	65	P	P	F	F	F	F	n/a	260
Nitouche	6	91	95	92	SL	M	75	F	P	G	G	G	F	n/a	250
Scuba	4	82	87	—	SL	E	80	P	P	F	F	F	F	n/a	230
SW Parade	4	97	88	113	SL	M	70	F	VG	G	F	F	G	n/a	220
Toledo	4	87	95	—	SL	M	70	P	P	G	G	F	F	n/a	280
Venture	4	97	88	—	SL	E	75	P	P	G	F	F	F	n/a	220
Maple															
CDC Acer	2	112	101	—	SL	L	60	F	VG	G	F	n/a	VG	F	170
CDC April	4	82	70	—	SL	L	60	F	P	G	F	n/a	—	n/a	140
CDC Vienna	5	86	81	—	SL	L	60	F	P	G	F	n/a	—	n/a	170
Courier	3	94	90	—	SL	M	75	F	P	F	P	n/a	VG	F	210
Whero	3	60	57	—	N	L	110	P	P	G	P	n/a	—	n/a	210
Silage															
CDC Sonata	3	109	100	—	N	L	85	F	VG	F	F	n/a	F	F	220
Trapper	7	74	73	—	N	L	95	P	P	F	P	n/a	—	—	140
Victoria	7	80	77	—	N	M	85	P	P	F	P	n/a	—	—	190

* Coop and regional trials in Saskatchewan.

**N-normal leaf type; SL-semi-leafless.

***Seed coat dimpling: VG=0-5%; G=6-20%; F=21-50%.

****Green seed coats: Good = 0-10%; Fair = 11-25%.

Relative ratings for disease, seed coat breakage, lodging, bleaching (for green seed varieties), seed coat dimpling, and green seed coats (for yellow seed varieties): VG-very good; G-good; F-fair; P-poor; VP-very poor

Detailed agronomic information may be found in the **Pulse Production Manual** available from the Saskatchewan Pulse Growers.

Chickpea - Kabuli

Main characteristics of varieties

Variety	Years tested	Yield (% Sanford) Area 1	Area 2	Leaf type*	Ascochyta blight**	Height (cm)	Days to flower	Maturity***	Seed weight (g/1000)
Sanford	7	100	100	U	VP	49	56	L	425
Amit (B-90)	5	128	139	F	F	46	55	M	265
CDC ChiChi	4	115	120	F	P	45	53	M	385
CDC Chico	7	136	147	F	P	45	51	E	265
CDC Diva	4	104	117	U	VP	43	52	M	490
CDC Xena	6	115	135	U	VP	44	52	M	470
CDC Yuma	7	113	116	F	P	47	53	L	410
Dwelley	3	86	88	U	VP	45	57	VL	490
Evans	4	90	98	U	VP	50	53	L	430

Chickpea - Desi

Main characteristics of varieties

	Years tested	Yield (% Myles) Area 1	Area 2	Leaf type*	Ascochyta blight**	Height (cm)	Days to flower	Maturity***	Seed weight (g/1000)	Seed shape****	Seed coat color*****
Myles	7	100	100	F	F	41	50	E	200	A	T
CDC Anna	5	108	111	F	F	42	52	M	210	P	T
CDC Desiray	6	96	107	F	F	37	49	E	210	P	LT
CDC Nika	5	95	103	F	F	39	50	M	320	P	T

* Leaf type: F=fern; U=unifoliate

** Ascochyta blight ratings: F - fair; P - poor, VP - very poor

*** Maturity will be delayed in areas with a cool moist summer, especially on clay soils.

**** Seed shape: P = plump; A = angular

***** Seed coat color: T = tan; LT = light tan

Additional Information

Kabuli chickpea is best adapted to stubble or summerfallow production in the Brown soil zone. Desi chickpea is best adapted to stubble production in the Brown and Dark Brown soil zones. Chickpea is a deep-rooted crop, which is efficient in water uptake. Planting on clay soils, regardless of soil zone, increases the risk of prolonged vegetative growth and failure to mature on time. This risk can be reduced by planting on sandier, drought prone soils. Chickpea will tolerate light frosts in the spring. Desi varieties can be seeded in late April or early May. Kabuli varieties should be planted between early to mid May into a warm seedbed, preferably at least 10°C average soil temperature at depth of seeding. This means that kabuli varieties are often later maturing.

Ascochyta blight can completely destroy a chickpea crop. Varieties listed in the recommendation tables differ in their resistance from "Very Poor" to "Poor" to "Fair"; none are rated as "Good". To date, fern-leaf varieties tend to develop less ascochyta blight than unifoliate-leaf varieties. Susceptibility to the disease increases at the flowering and early podding stage. Field scouting for disease symptoms should begin in early June and continue throughout the growing season. Scouting should concentrate on areas where the risk of early infection is higher, e.g. fields adjacent to previous chickpea crops, where plant densities are higher, and in higher moisture areas. Scouting field margins is not sufficient. Fungicide application(s) may be necessary to protect crops. Disease risk is greater under conditions of frequent showers and/or heavy dew, and for varieties rated as Poor or Very Poor. Ascochyta blight is seed-borne and stubble-borne, therefore, growers should use seed with ascochyta blight levels as close to 0% as possible, and plant chickpea in the same field no more than once in four years.

Chickpea requires planting equipment with a seed-feeding mechanism capable of handling large seeds. Chickpea seeds are highly susceptible to damage and should be handled gently at all times. Seed treatment with Apron FL/ Allegiance FL (metalaxyl) for seed

Chickpea (Continued from page 19)
rot diseases is strongly recommended for kabuli varieties, and may be required for desi varieties if conditions favour seed rotting diseases. Seed treatment with Crown (carbathiin and thiabendazole) is strongly recommended for both desi and kabuli varieties to reduce the severity of seed-borne ascochyta blight. Plant chickpea seeds approximately 6 cm deep. Seeding rates vary with seed size; target 4 plants/ft^2. Desi varieties are generally earlier maturing and higher yielding compared to the currently available kabuli varieties. The chickpea crop has stiff stems and can be swathed or straight cut at maturity. Thresh kabuli varieties gently to avoid seed splitting. All **kabuli** chickpea varieties listed have normal ("ram's head") seed shape, with the exception of **Amit** which has a round seed shape.

Certified Seed of **CDC Yuma, CDC Xena, CDC Chico, CDC Desiray, CDC Diva, CDC Anna, and CDC Nika** will be available in 2003.

For more details on production consult the *Pulse Production Manual*, published by the Saskatchewan Pulse Growers.

Faba Bean

Main characteristics of varieties

Variety	Years tested	Yield as % of Outlook (Northeast) Dryland	Yield as % of Outlook (South-central) Irrigated	Maturity in days	Seed weight (g/1000)
Outlook	15	100	100	109	360
Aladin	15	104	110	112	400
CDC Blitz	6	101	105	109	410
CDC Fatima	8	100	104	105	520
Cresta	3	92	101	105	630
Orion	6	95	94	103	350
Scirocco	3	96	110	107	550

Additional Information

Faba bean should be seeded early (late April to early May). It is best adapted to irrigated areas in the Dark Brown Soil Zone and the portion of the Black Soil Zone with the longest growing season.

Seed supplies of **CDC Blitz**, **Scirocco** and **Cresta** are limited.

Faba bean is a legume and thus is able to fix nitrogen from the air, provided the seed is inoculated with the proper bacteria prior to planting.

The Advisory Council on Grain Crops, a committee of the Saskatchewan Agricultural Services Co-ordinating Committee (SASCC), supervises, co-ordinates and reviews the collection, analysis and reporting of information in this pamphlet.

Membership of the Advisory Council on Grain Crops consists of representatives from:

- Agriculture and Agri-Food Canada
- Saskatchewan Agriculture and Food
- University of Saskatchewan
- Crop Development Centre
- Saskatchewan Wheat Pool
- Canadian Seed Trade Association
- Saskatchewan Seed Growers' Association
- Saskatchewan Association of Rural Municipalities
- Farmers
- Saskatchewan Irrigation Development Centre
- Representatives from Saskatchewan Seed Distributing Companies

The Advisory Council on Grain Crops gratefully acknowledges the contributions of Saskatchewan Agriculture and Food, Agriculture and Agri-Food Canada, the University of Saskatchewan, the Crop Development Centre, Saskatchewan Wheat Pool and all others who were involved in the research and analysis which led to the recommendations made in this publication.

Contributing Agencies

Saskatchewan Agriculture, Food and Rural Revitalization

POOL Saskatchewan Wheat Pool

University of Saskatchewan

Agriculture and Agri-Food Canada / Agriculture et Agroalimentaire Canada

Seed Facts

Pedigreed Seed
Use certified seed regularly, especially when changing to a different variety. This assures that the seed has high genetic purity, high germination and is relatively free from weeds and other crop seeds. Some pedigreed seed may be paid for by an over-quota delivery of commercial grain. Ask your elevator agent or seed dealer for details.

Reuse of Hybrid Variety Seed
Seed grown from a hybrid variety (regardless of crop or variety) should not be reused since a 20 to 25 percent yield reduction can occur in the next generation. This reduction is due to loss of hybrid vigour and possible occurrence of male-sterile plants. Lack of uniformity for maturity and quality traits will also occur.

Seed Cleaning
Seed should be cleaned carefully to remove weed seeds, trash, small or broken kernels, ergot and sclerotia. **Not all seed-cleaning plants are equipped to clean grain to seed standards.**

Seed Treatment
Use of seed from cereal crops infected with Fusarium may result in poor emergence. Such seed should be treated with a registered fungicide before planting. Use of infected seed may introduce Fusarium diseases into unaffected areas.

Smuts that attack wheat, barley, oat and rye can be controlled by chemical seed treatment. If seed from a crop in which bunt or smut was observed must be used for seed, seed treatment should be considered. **If the presence of smut is uncertain, varieties rated VERY POOR should be treated every year, those rated POOR every second year and those rated FAIR every third year**.

Only systemic fungicides will control true loose smut of barley and wheat, and stem smut of rye. Pathogens causing the other types of smut (covered, false loose, oat and bunt) are carried on the outside of the seed and can be controlled by non-systemic seed treatments containing maneb or thiram.

The virulent form of blackleg of canola is widespread in Saskatchewan. Seed treatment with a recommended fungicide can reduce the level of disease. Use of canola seed commercially coated with an appropriate seed dressing is a convenient alternative to on-farm seed treatment.

Various fungicides have been registered for the control of seedling diseases. Flax, canola, rye and winter wheat seed should be treated to promote good seedling growth.

Wireworms, which attack all grain crops, and flea beetles, which attack canola and mustard, can be controlled by seed treatment with insecticides. At the time of publication, the insecticide lindane was no longer registered for flea beetle control, but alternatives are available.

Read the label carefully before using any seed treatment or insecticide. Information on their use and recommended rates is found in the *Guide to Crop Protection* 2003 (SAFRR publication). Carryover stocks of treated seed should be tested for germination before using. Treated seed must not be delivered to an elevator or used for feed.

Seed-borne diseases of pulses
Pulse growers should use seed that has been tested for seed-borne diseases such as ascochyta, anthracnose and botrytis. Tolerances for seed infection vary with the pulse crop, the disease, weather conditions of the region and the availability of a seed treatment. If infection of the crop from sources other than seed is likely, using seed with low infection levels becomes less important.

In regions with frequent rainfall and high humidity, tolerances will be lower. Thus, for ascochyta blight of lentil use of seed with up to five per cent seed infection is acceptable in the Brown and Dark Brown Soil Zones, but zero per cent is desirable in the Black Soil Zone. In pea, up to 10 per cent seed infection with ascochyta is acceptable. In chickpea, zero per cent ascochyta seed infection is recommended because of the high rate of transmission of the disease from the seed to the emerging seedlings and its highly destructive nature. **A seed treatment for ascochyta-infected lentil seed is now available and is recommended if seed infection levels approach five per cent.**

Ergot
Ergot attacks all varieties of rye, triticale, wheat and barley, as well as most common grass species. Oat is rarely attacked and all broadleaf species are immune. Grain containing 0.1 per cent ergot is considered poisonous and should not be used for food. Details of this disease are found in *Ergot of Grains and Grasses* (Agriculture and Agri-Food Canada Publ. 1438).

Seed Inoculation
Legume crops obtain much of their nitrogen (N) requirement by forming a symbiotic association with soil bacteria called *Rhizobium*. These bacteria colonize the roots to form structures called nodules where they fix nitrogen for the legume plant. To enhance nitrogen fixation, the legume crop seed should be inoculated. **Use the proper strain of bacteria specific to that crop**. For further details, consult the *Pulse Production Manual* (Saskatchewan Pulse Growers).

Damp and Frozen Seed
Seed which is stored damp or tough may be low in germination. Grain which will be used for seed should be dried, if necessary, soon after harvest. The drying temperature should be below 37 degrees celcius for batch driers and 43 degrees celcius for recirculating and continuous driers. Frozen grain should always be tested for germination by a seed-testing laboratory before planting. Such grain will frequently produce a high percentage of abnormal seedlings.

Production Notes
All wheat classes, including durum and triticale, are susceptible to wheat midge. Farmers in infested areas should be prepared to spray fields with recommended insecticides if necessary. Refer to the SAFRR publication *Wheat Midge*.

Residue of infected crops may harbour disease pathogens. Seeding into stubble of the same crop kind will increase disease risk, particularly in higher rainfall areas.

Breeding institutions and seed distributors of varieties listed in this publication

Crop kind, Class & Variety	Breeding Institution	Distributor
Wheat		
Bread Wheat		
5500HR	Agripro/Agricore United	Proven Seed
5600 HR	Agripro/Agricore United	Proven Seed
5601HR	Agripro/Agricore United	Proven Seed
AC Abbey	AAFC (Swift Current)	Canterra Seeds
Alsen		Canterra Seeds
AC Barrie	AAFC (Swift Current)	SeCan Members
CDCBounty	U of S - CDC	Canterra Seeds
AC Cadillac	AAFC (Swift Current)	QAS
Columbus	AAFC (Winnipeg)	SeCan Members
AC Cora	AAFC (Winnipeg)	SeCan Members
AC Domain	AAFC (Winnipeg)	SeCan Members
AC Eatonia	AAFC (Swift Current)	Proven Seed
AC Elsa	AAFC (Swift Current)	SeCan Members
AC Intrepid	AAFC (Swift Current)	Canterra Seeds
Harvest	AAFC (Winnipeg)	QAS
Journey	Sask. Wheat Pool	Sask. Wheat Pool
Katepwa	AAFC (Winnipeg)	SeCan Members
Laura	AAFC (Swift Current)	SeCan Members
Lovitt		Canterra Seeds
AC Majestic	AAFC (Winnipeg)	SeCan Members
McKenzie	Sask. Wheat Pool	SWP/Proven Seed
Prodigy	Sask. Wheat Pool	SWP/Proven Seed
AC Splendor	AAFC (Winnipeg)	SeCan Members
Superb	AAFC (Winnipeg)	SeCan Members
CDC Teal	U of S - CDC	QAS
Canada Prairie Spring Wheat		
5700PR	Agripro/Agricore United	Proven Seed
5701PR	Agripro/Agricore United	Proven Seed
AC 2000	AAFC (Swift Current)	SeCan Members
AC Crystal	AAFC (Swift Current)	SeCan Members
AC Foremost	AAFC (Swift Current)	SeCan Members
AC Karma	AAFC (Swift Current)	SeCan Members
AC Taber	AAFC (Swift Current)	SeCan Members
AC Vista	AAFC (Swift Current)	QAS
Canada Western Extra Strong		
Amazon	University of Manitoba	Canterra Seeds
AC Corinne	AAFC (Winnipeg)	QAS
AC Glenavon	AAFC (Winnipeg)	SeCan Members
CDC Rama	U of S – CDC	QAS
Glenlea	University of Manitoba	Public
Hard White Spring Wheat		
Kanata	AAFC (Winnipeg)	QAS
Snowbird	AAFC (Winnipeg)	QAS
Durum		
AC Avonlea	AAFC (Swift Current)	QAS
Kyle	AAFC (Swift Current)	SeCan Members
AC Melita	AAFC (Winnipeg)	SeCan Members
AC Morse	AAFC (Winnipeg)	SeCan Members
AC Napoleon	AAFC (Winnipeg)	Canterra Seeds
AC Navigator	AAFC (Swift Current)	Sask. Wheat Pool
Sceptre	U of S - CDC	SeCan Members
Soft White Spring Wheat		
Fielder	USDA/AAFC (Lethbridge)	Public
AC Nanda	AFFC (Lethbridge)	QAS
AC Phil	AAFC (Lethbridge)	SeCan Members
AC Reed	AAFC (Lethbridge)	SeCan Members
Winter Wheat		
ACBellatrix	AAFC (Lethbridge)	QAS
CDC Buteo	U of S – CDC	
CDC Clair	U of S - CDC	SeCan Members
CDC Falcon	U of S - CDC	SeCan Members
CDC Harrier	U of S - CDC	SeCan Members
CDC Kestrel	U of S - CDC	Canterra Seeds
CDC Osprey	U of S - CDC	Canterra Seeds
CDCRaptor	U of S - CDC	SeCan Members
McClintock		
Winter Rye		
AC Remington	AAFC (Swift Current)	Proven Seed
Danko		Proven Seed
Kodiak	University of Alberta	Proven Seed
Prima	AAFC (Swift Current)	SeCan Members
AC Rifle	AAFC (Swift Current)	Proven Seed/Canterra
Spring Rye		
Gazelle	U of S	Public
Triticale		
AC Alta	AAFC (Swift Current)	Progressive Seeds
AC Ultima	AAFC (Swift Current)	QAS
AC Certa	AAFC (Swift Current)	Progressive Seeds
AC Copia	AAFC (Swift Current)	QAS
Bobcat	AAFRD (Lacombe)	Progressive Seeds
Pika	AAFRD (Lacombe)	Progressive Seeds
Pronghorn	AAFRD (Lacombe)	Progressive Seeds
Sandro	Swiss Fed Ag Res	ProMark Seed
Barley		
Malting		
B1602	Busch Ag. Res.	Sask.Wheat Pool
CDCBattleford	U of S - CDC	SeCan Members
Calder	AAFC (Brandon)	SeCan Members
CDC Copeland	U of S - CDC	SeCan Members
Excel	U of Minnesota	Proven Seed, Others
CDC Goodale	U of S – CDC	
CDC Kendall	U of S - CDC	Proven Seed/SWP
Harrington	U of S - CDC	SeCan Members
Legacy	Busch Ag Res.	SWP/Proven Seed
AC Metcalfe	AAFC (Brandon)	SeCan Members
Merit	Busch Ag. Res.	SWP/Proven Seed
Newdale	AAFC (Brandon)	QAS
Robust	U of Minnesota	Cargill Seed, Others
CDC Select	U of S - CDC	Proven Seed
CDC Sisler	U of S - CDC	Proven Seed
Stein	U of S - CDC	Proven Seed
CDC Stratus	U of S - CDC	QAS
CDC Tisdale	U of S – CDC	QAS
CDC Yorkton	U of S - CDC	Proven Seed
AC Bountiful	AAFC (Brandon)	QAS
Feed		
CDC Dolly	U of S - CDC	SeCan Members
CDC Fleet	U of S - CDC	QAS
AC Harper	AAFC (Lethbridge)	SeCan Members
CDCHelgason	U of S - CDC	SeCan Members
AC Lacombe	AAFC (Lacombe)	SeCan Members
Niobe	AAFRD (Lacombe)	SeCan Members
AC Rosser	AAFC (Brandon)	SeCan Members

AC	- as a prefix to variety names Agriculture Canada (Agriculture and Agri-Food Canada)
AAFC	- Agriculture and Agri-Food Canada
CDC	- Crop Development Centre
AAFRD	- Alberta Agriculture Food and Rural Development, Lacombe, Alta.
U	- University
U of S	- University of Saskatchewan, Saskatoon
USDA	- United States Department of Agriculture
QAS	- Quality Assured Seeds
SWP	- Saskatchewan Wheat Pool

Breeding institutions and seed distributors (continued)

Crop kind, Class & Variety	Breeding Institution	Distributor
Stander	U of Minnesota	Sask. Wheat Pool
Trochu	AAFRD (Lacombe)	SeCan Members
Xena	Agricore/W. Plant Breeders	Proven Seed/SWP
Hulless		
AC Bacon	AAFC (Brandon)	SeCan Members
CDC Dawn	U of S - CDC	SeCan Members
Falcon	AAFRD (Lacombe)	Progressive Seeds
CDC Freedom	U of S - CDC	SeCan Members
CDC Gainer	U of S - CDC	QAS
HB805	W. Plant Breeders	Proven Seed
CDC McGwire	U of S - CDC	SeCan Members
Peregrine	AAFRD (Lacombe)	Progressive Seeds
Phoenix	AAFRD (Lacombe)	Progressive Seeds
CDC Speedy	U of S - CDC	QAS
Tercel	AAFRD (Lacombe)	Progressive Seeds
Intensive Management		
CDC Bold	U of S - CDC	Canterra Seeds
CDC Earl	U of S - CDC	SeCan Members
Kasota	AAFRD (Lacombe)	SeCan Members
Mahigan	AAFRD (Lacombe)	SeCan Members
Niska	AAFRD (Lacombe)	Canterra Seeds
CDC Thompson	U of S - CDC	QAS
Vivar	AAFRD (Lacombe)	SeCan Members
Oat		
AC Assiniboia	AAFC (Winnipeg)	Proven Seed
CDC Boyer	U of S - CDC	SeCan Members
Boudrias	AAFC (Lacombe)	QAS
Calibre	U of S - CDC	SeCan Members
CDC Dancer	U of S - CDC	QAS
CDC Orrin	U of S - CDC	QAS
Derby	U of S - CDC	Proven Seed
AC Gwen	AAFC (Winnipeg)	SeCan Members
Kaufmann	AAFC (Lacombe)	SeCan Members
AC Morgan	AAFC (Lacombe)	SeCan Members
CDC Pacer	U of S - CDC	QAS
Pinnacle	AAFC (Winnipeg)	QAS
Ronald	AAFC (Winnipeg)	SeCan Members
SW Exactor	Svalof Weibull AB	QAS
Triple Crown	Svalof Weibull AB	ProMark Seed
CDC Baler	U of S - CDC	QAS
CDC Bell	U of S - CDC	Proven Seed
AC Murphy	AAFC (Lacombe)	SeCan Members
Canola		
Argentine		
AC Excel	AAFC (Saskatoon)	SeCan Members
215CL	Advanta Seeds	Advanta Seeds
243CL	Advanta Seeds	Advanta Seeds
289CL	Advanta Seeds	Advanta Seeds
499RR	DSV Canada	Prairie Seeds
505RR	Advanta Seeds	Advanta Seeds
519RR	Advanta Seeds	Advanta Seeds
811RR	DSV Canada	Federated Co-op
1492	NPZ-LEMBKE	Canterra Seeds
1604	AgriProgress	Canterra Seeds
1812	DSV Canada	Canterra Seeds
23-38	Monsanto Canada	Monsanto Canada
2573	Bayer CropScience	Bayer CropScience
2663	Bayer CropScience	Bayer CropScience
2733	Bayer CropScience	Bayer CropScience
3235	Monsanto Canada	Monsanto Canada
34-55	Monsanto Canada	Monsanto Canada
35-85	Monsanto Canada	Monsanto Canada
45H21	Pioneer Hi-Bred	Pioneer Hi-Bred
45A51	Pioneer Hi-Bred	Pioneer Hi-Bred
45A54	Pioneer Hi-Bred	Pioneer Hi-Bred
45A55	Pioneer Hi-Bred	Pioneer Hi-Bred
46A65	Pioneer Hi-Bred	Pioneer Hi-Bred
46A73	Pioneer Hi-Bred	Pioneer Hi-Bred
46A76	Pioneer Hi-Bred	Pioneer Hi-Bred
Agassiz	DSV Canada	LiBred
Ascent	DSV Canada	LiBred
Canterra1867	IMC Cargill	Canterra Seeds
Conquest	U of Alberta	Sask Wheat Pool
DS-Roughrider	Danisco Seeds	SeCan Members
EAGLE	Svalof Weibull AB	SeCan Members
Foremost	DLF-Trifolium	Seed Link Inc.
Heritage	Monsanto Canada	ProMark,Northstar
Hi-Q	University of Alberta	Sask Wheat Pool
Hudson	Danisco Seeds	QAS
HYLITE 225RR	Monsanto Canada	Advanta Seeds
Hyola 401	Advanta Seeds	Advanta Seeds
HY-PER Star 100	NPZ/LEMBKE	QAS
IMPULSE	Svalof Weibull AB	ProMark Seed
Kelsey	U. of Alberta	Sask. Wheat Pool
279	DSV Canada	LiBred
561RR	DSV Canada	LiBred
LBD612RR	DSV Canada	LiBred
799RR	DSV Canada	LiBred
LoLinda	Bonis and Company	Sask. Wheat Pool
Prairie 715RR	DSV Canada	Prairie Seeds
Q2	U. of Alberta	Sask. Wheat Pool
Sentry	U of Manitoba	
Skyhawk	DLF-Trifolium	ProMark,Northstar, Prairie
SP AdmirableRR	Sask. Wheat Pool	Sask. Wheat Pool
SP Armada	Sask. Wheat Pool	Sask. Wheat Pool
SP Banner	Sask. Wheat Pool	Sask. Wheat Pool
SP Bucky	Sask. Wheat Pool	Sask. Wheat Pool
SW 5001	Svalof Weibull AB	Sask. Wheat Pool
SW ARROW(RR)	Svalof Weibull AB	SWP/Proven Seed
SW GladiatoRR	Svalof Weibull AB	QAS
SW RazoR (RR)	Svalof Weibull AB	ProMark Seed
SW RideR (RR)	Svalof Weibull AB	SWP/Proven Seed
Thunder	DSV Canada	Federated Co-op
Polish		
41P55	Pioneer Hi-Bred	Proven Seed
1000 SP	Advanta Seeds	Canterra Seeds
1007	Svalof Weibull AB	Canterra Seeds
ACS-C7	AAFC (Saskatoon)	
Cash	Svalof Weibull AB	ProMark Seed
FAIRVIEW	Svalof Weibull AB	Sask. Wheat Pool
Hysyn 110	Advanta Seeds	Advanta Seeds
Hysyn 111	Advanta Seeds	Advanta Seeds
AC Parkland	AAFC (Saskatoon)	SeCan Members
Reward	U of Manitoba	SeCan Members
AC Sunbeam	AAFC (Beaverlodge)	SeCan Members
WESTWIN	Svalof Weibull AB	LiBred
Flax		
CDC Arras	U of S – CDC	QAS
CDC Bethune	U of S – CDC	SeCan Members
AC Carnduff	AAFC (Morden)	SeCan Members
CDC Mons	U of S – CDC	QAS
AC Emerson	AAFC (Morden)	SeCan Members
Flanders	U of S - CDC	SeCan Members
AC Hanley	AAFC (Morden)	SeCan Members
AC Lightning	AAFC (Morden)	Canterra Seeds
Linola™ 2047	CSIRO/UGG	Proven Seed
Linola™ 1084	CSIRO/UGG	Proven Seed
Macbeth	AAFC (Morden)	
AC McDuff	AAFC (Morden)	Proven Seed
NorLin	AAFC (Morden)	SeCan Members
CDC Normandy	U of S - CDC	SeCan Members
Somme	U of S - CDC	SeCan Members
Taurus	Cebeco Zaden	QAS
CDC Valour	U of S - CDC	SeCan Members
Vimy	U of S - CDC	SeCan Members
AC Watson	AAFC (Morden)	Sask. Wheat Pool

Breeding institutions and seed distributors (continued)

Crop kind, Class & Variety	Breeding Institution	Distributor
Mustard		
Brown		
commercial		Trade
Andante		
Duchess	Proven Seed	Proven Seed
Oriental		
Cutlass	AAFC (Saskatoon)	Trade
Forge	Colman's of Norwich	Sask. Wheat Pool
AC Vulcan	AAFC (Saskatoon)	Sask. Wheat Pool
Yellow		
AC Base	AAFC (Saskatoon)	
AC Pennant	AAFC (Saskatoon)	Sask. Wheat Pool
Tilney	Colman's of Norwich	Proven Seed
Viscount	Colman's of Norwich/UGG	Proven Seed
Sunflower		
63A21	Pioneer Hi-Bred	Pioneer Hi-Bred
63A70	Pioneer Hi-Bred	Pioneer Hi-Bred
IS 6111	Interstate Seeds	Advanta Seeds
IS 8048	Advanta Seeds	Advanta Seeds
P6150	Pioneer Hi-Bred	Pioneer Hi-Bred
Field Pea		
CDC Acer	U of S – CDC	Sask. Pulse Growers
DSAdmiral	Danisco Seeds	QAS
ACAdvantage	AAFC Morden	Secan Members
Alfetta	Cebeco Zaden	QAS
Badminton	Progene	West-Son Products Ltd.
CDC April	U of S - CDC	QAS
SW Belfield	Svalof Weibull AB	Bonis & Co.
SWBravo	Svalof Weibull AB	Canterra Seeds
SWCapri	Svalof Weibull	Canterra Seeds
Carneval	Svalof Weibull AB	Sask. Wheat Pool
SW Circus	Svalof Weibull AB	SeCan Members
COBRA	Danisco Seeds	Canterra Seeds
Courier	N.Z. Crop & Food	Canterra Seeds
CROMA	Cebeco Zaden	Canterra Seeds
Cruiser	NZ Crop & Food	Canterra Seeds
Delta	Cebeco Zaden	QAS
DSDominator	Danisco Seeds	QAS
Eclipse	Cebeco Zaden	QAS
Espace	Cebeco Zaden	St. Denis Seeds AB
GRANDE	Svalof Weibull AB	Sask. Wheat Pool
CDC HANDEL	U of S - CDC	Sask. Pulse Growers
INTEGRA	Cebeco Zaden	St. Denis Seeds AB
Logan	Proven Seed	Proven Seed
Madoc		Terramax
Mandy	Manshoit	Terramax
MAJORET	Svalof Weibull AB	ProMark Seed
AC Melfort	AAFC Morden	Canterra Seeds
Miami	Advanta Seeds.	QAS
Millenium	Manshoit	Terramax
CDC Minuet	U of S - CDC	Sask. Pulse Growers
CDC Montero	U of S - CDC	Sask. Pulse Growers
CDC MOZART	U of S - CDC	Sask. Pulse Growers
Nicole	Advanta Seeds	QAS
NITOUCHE	DLF Trifolium (Denmark)	QAS
SW Parade	Svalof Weibull AB	Sask. Wheat Pool
SW Prize	Svalof Weibull AB	Nodricks Norsask
SWSalute	Svalof Weibull	ProMark Seed
Scuba	Advanta Seeds	QAS
CDC Sonata	U of S - CDC	Sask. Pulse Growers
DS Stalwarth	Danisco Seeds	Secan Members
CDC Striker	U of S – CDC	Sask. Pulse Growers
SWING	Cebeco Zaden	QAS
TOLEDO	Cebeco Zaden	Canterra Seeds
Trapper	AAFC (Morden)	Public
Venture	Axel Toft	Johnson Seeds (MB)
CDC VERDI	U of S - CDC	Sask. Pulse Growers
Victoria	Svalof Weibull AB	ProMark Seed

Crop kind, Class & Variety	Breeding Institution	Distributor
CDC Vienna	U of S - CDC	Walker Seed
Whero	Challenge Seeds	ProMark Seed
Lentil		
CDC Blaze	U of S - CDC	Sask. Pulse Growers
CDC LeMay	U of S - CDC	Sask. Pulse Growers
CDC Plato	U of S - CDC	Sask. Pulse Growers
Crimson	Public	
Eston	U of S - CDC	SeCan Members
CDC Glamis	U of S - CDC	Sask. Pulse Growers
CDC Grandora	U of S - CDC	Sask. Pulse Growers
CDC Matador	U of S - CDC	
CDC Milestone	U of S - CDC	Sask. Pulse Growers
Laird	U of S - CDC	SeCan Members
CDC Redcap	U of S - CDC	Sask. Pulse Growers
CDC Redwing	U of S - CDC	Sask. Wheat Pool
CDC Richlea	U of S - CDC	SeCan Members
CDC Robin	U of S - CDC	Sask. Pulse Growers
CDC Sedley	U of S - CDC	Sask. Pulse Growers
CDC Sovereign	U of S - CDC	Sask. Pulse Growers
CDC Vantage	U of S - CDC	Sask. Pulse Growers
Faba Bean		
Aladin	University of Manitoba	Public
CDC Blitz	U of S - CDC	
Cresta	Saatbau Linz	Canterra Seeds/Agriprogress Inc.
CDC Fatima	U of S - CDC	R.Legumex/Walker S.
Orion	AAFC (Lacombe)	Roger Lee. Lyster Farm
Outlook	U of S - CDC	SeCan Members
Scirocco	NPZ-Lembke	Agriprogress Inc.
Dry Bean		
AC Polaris		
AC Redbond		
CDC Camino	U of S - CDC	Sask. Pulse Growers
CDC Crocus	U of S - CDC	Klempnauer
CDC Minto	U of S - CDC	Sask. Pulse Growers
CDC Polar Bear	U of S - CDC	Sask Pulse Growers
Othello	USDA/ARS (Prosser, WA)	Public
Earliray	Gen-Tec	Gen-Tec
US 1140	USDA	Public
CDC Expresso	U of S - CDC	Canterra Seeds
CDC Nighthawk	U of S - CDC	QAS
CDC Nordic	U of S - CDC	Sask. Pulse Growers
CDC Pintium	U of S - CDC	Sask. Pulse Growers
CDC Rosalee	U of S - CDC	QAS
UI 906	University of Idaho	Public
Viva		Public
CDC Pinnacle	U of S - CDC	Sask. Pulse Growers
CDC Altiro	U of S - CDC	Sask. Pulse Growers
Chickpea		
Desi		
CDC Anna	U of S - CDC	Sask. Pulse Growers
CDC Desiray	U of S - CDC	Sask. Pulse Growers
Myles	USDA/Washington State U	Public
CDC Nika	U of S - CDC	Sask. Pulse Growers
Kabuli		
Amit (B-90)		Proven Seed
CDC Chico	U of S - CDC	Sask. Pulse Growers
CDC ChiChi	U of S - CDC	Sask. Pulse Growers
CDC Diva	U of S - CDC	Sask. Pulse Growers
Dwelley	USDA/Washington State U	Public
Evans	USDA/Washington State U	Public
Sanford	USDA/Washington State U	Public
CDC Xena	U of S - CDC	Sask. Pulse Growers
CDC Yuma	U of S - CDC	Sask. Pulse Growers
Canary Seed		
Elias	U of Minnesota; U of S - CDC	Public
Keet	U of Minnesota; U of S - CDC	Public
CDC Maria	U of S - CDC	C. Special Crops
Safflower		
Saffire	AAFC (Lethbridge)	Jerry Kubic (AB)
AC Stirling	AAFC (Lethbridge)	SeCan Members
AC Sunset	AAFC (Lethbridge)	Proven Seed